

What is claimed is:

1. A method of processing data in a stateful protocol processing system, said method comprising:

receiving a first message of a first flow comprised of a first plurality of messages;

5 deriving a first event from said first message;

retrieving a first flow state characterizing said first flow, said first flow state including a first workspace portion and a second workspace portion;

assigning said first workspace portion to a first protocol processing core and said second workspace portion to a second protocol processing core; and

10 processing said first event using said first protocol processing core and said second protocol processing core.

2. The method of claim 1 wherein said first flow state is defined at least in part by a plurality of protocol layers, said first workspace portion and said second workspace portion  
15 corresponding to different ones of said plurality of protocol layers.

3. The method of claim 1 wherein said processing includes modifying said first workspace portion in order to thereby yield a modified first workspace portion, and writing back said modified first workspace portion.  
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4. The method of claim 3 wherein said processing further includes communicating an inter core event from said first protocol processing core to said second protocol processing core.

5. The method of claim 4 wherein said second protocol processing core modifies said second workspace portion in order to create a modified second workspace portion and writes  
25 back said second modified workspace portion.

6. The method of claim 1 wherein said first protocol processing core issues a done signal upon completing processing of said first event, said done signal causing release of an event  
30 queue element associated with said first protocol processing core.

7. The method of claim 1 wherein said first flow state further includes a shared flow state provided to both said first protocol processing core and said second protocol processing core.
8. The method of claim 7 wherein said first protocol processing core generates a flow state write mask upon modifying selected areas of said shared flow state portion, said flow state write mask preventing said selected areas from being overwritten.
9. A stateful protocol processing system configured to process multiple flows of messages, said apparatus comprising:
- a first protocol processing core;
  - a second protocol processing core;
  - an input module configured to receive a first message of a first flow comprised of a first plurality of messages and to derive a first event from said first message;
  - a lookup controller operative to retrieve a first flow state characterizing said first flow, said first flow state including a first workspace portion assigned to said first protocol processing core and a second workspace portion assigned to said second protocol processing core;
  - wherein said first event is processed using said first protocol processing core and said second protocol processing core.
10. The apparatus of claim 9 wherein said first flow state is defined at least in part by a plurality of protocol layers, said first workspace portion and said second workspace portion corresponding to different ones of said plurality of protocol layers.
11. The apparatus of claim 9 wherein said first protocol processing core modifies said first workspace portion and thereby creates a modified first workspace portion, said first protocol processing core further writing back said modified first workspace portion to said lookup controller.
12. The apparatus of claim 11 wherein said first protocol processing core transmits an inter core event to said second protocol processing core.

13. The apparatus of claim 11 wherein said second protocol processing core modifies said second workspace portion in order to create a modified second workspace portion and writes back said second modified workspace portion to said lookup controller.
- 5 14. The apparatus of claim 9 wherein said first protocol processing core issues a done signal upon completing processing of said first event, said done signal causing release of an event queue element associated with said first protocol processing core.
- 10 15. The apparatus of claim 9 wherein said first flow state further includes a shared flow state provided to both said first protocol processing core and said second protocol processing core.
16. The apparatus of claim 15 wherein said first protocol processing core generates a flow state write mask upon modifying selected areas of said shared flow state portion, said flow state write mask preventing said selected areas from being overwritten.
- 15 17. A method of processing data in a stateful protocol processing system, said method comprising:
- receiving a first message of a first flow comprised of a first plurality of messages;
  - deriving a first event from said first message;
  - 20 retrieving from a common memory a first flow state characterizing said first flow, said first flow state including a first workspace portion and a second workspace portion;
  - storing said first workspace portion in a first local memory and said second workspace portion in a second local memory distinct from said first local memory;
  - processing said first event and making corresponding modifications within said first
  - 25 workspace portion and said second workspace portion, thereby yielding a modified first workspace portion and a modified second workspace portion, respectively; and
  - writing said modified first workspace portion and said modified second workspace portion to said common memory.
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18. The method of claim 17 wherein said first local memory is associated with a first protocol processing core and said second local memory is associated with a second protocol processing core.
- 5 19. The method of claim 18 wherein said first protocol processing core performs an initial portion of said processing of said first event and then hands off said first event to said second protocol processing core for performance of a subsequent portion of said processing of said first event.
- 10 20. The method of claim 19 wherein said first protocol processing core modifies said first workspace portion in connection with said initial portion of said processing and said second protocol processing core modifies said second workspace portion in connection with said subsequent portion of said processing.
- 15 21. The method of claim 18 wherein said first protocol processing core performs an initial portion of said processing of said first event and said second protocol processing core subsequently performs a final portion of said processing of said first event.
22. The method of claim 21 wherein said modified first workspace portion and said modified  
20 second workspace portion are written back to said common memory substantially contemporaneously subsequent to completion of said final portion of said processing of said first event.
23. The method of claim 17 wherein said modified first workspace portion and said modified  
25 second workspace portion are written to said common memory as a contiguous block.
24. The method of claim 17 wherein said first workspace portion and said second workspace portion are stored within a contiguous block within said common memory.

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25. The method of claim 17 wherein said first flow state is defined at least in part by a plurality of protocol layers, said first workspace portion and said second workspace portion corresponding to different ones of said plurality of protocol layers.
- 5 26. The method of claim 17 wherein said first flow state is defined at least in part by a plurality of protocol layers, said first workspace portion and said second workspace portion corresponding to different ones of said plurality of protocol layers.